



PAKISTAN FMD BULLETIN

Significant Project Activities

1. FMD Outbreaks Reported

FMD outbreaks reported and attended in different regions of Pakistan from July to September 2014 are shown in Table 1 & Map 1.

Table 1: ELISA Results of FMD Outbreaks (July - September 2014)

Province	Total Outbreaks	FMD serotypes						ELISA Negative
		0	A	Asia-1	O+A	O + Asia-1	A+Asia-1	
Punjab	11	4	6	-	-	-	-	1
Sindh	111	43	8	28	7	3	7	15
Khyber Pakhtunkhwa	28	14	2	-	-	-	-	12
Balochistan	6	4	-	-	-	-	-	2
Gilgit-Baltistan	-	-	-	-	-	-	-	-
FATA	-	-	-	-	-	-	-	-
AJK	49	29	1	-	-	-	-	19
Islamabad	-	-	-	-	-	-	-	-
Total	205	94	17	28	7	3	7	49

2. Production of Quality Foot and Mouth Disease Vaccine in Pakistan

FMD is endemic and wide spread (in fact the most prevalent infectious disease of livestock) in Pakistan and occurs throughout the year. Three serotypes O, A and Asia-1 of FMD virus are currently present in the livestock population of Pakistan. According to farmers, **FMD does not kill the animal, rather it kills the farmer** (economically). Based upon the geographical location of the country, livestock production systems, financial resources and structure and capacity of veterinary service, progressive control of FMD through vaccination is the best option. Pakistan has a large livestock population including 74.3 million cattle and buffaloes and 95.7 million sheep and goats. Thus Pakistan would require over 200 million doses per annum (85% vaccination rate) of good quality vaccine for effective disease control. Vaccination plays an important role in the

control and prevention of FMD. Project has practically proved that a well-formulated quality vaccine containing appropriate strains of FMD virus can provide protection against the disease in



Pakistan. Following this strategy, the Project has demonstrated in >200,000 animals (cattle and buffaloes) that FMD both in urban/peri-urban dairy colonies and rural smallholders dairy production settings in all provinces / regions of the country can be effectively controlled. Currently produced FMD vaccines in the country do not

meet the international standards and are not very effective controlling the disease in the field. Production of a good quality vaccine containing relevant FMD virus strains requires i) collection and characterization of circulating serotypes and subtypes (genetic characterization and vaccine matching) through effective disease surveillance; ii) selection and adaptation of selected strains for vaccine production; iii) Vaccine production based on suspension culture technology (economy of scale) and iv) independent vaccine quality control. In Pakistan, quality FMD vaccine production requires new infrastructure including building, equipment and technology. It is expensive and would cost around 40 to 50 million US dollars. Various strategies for quality FMD vaccine production in the country are:

A. Short term: Immediate option could be getting bulk formulated vaccine (containing local strains) from internationally accredited vaccine manufacturers and dispensing locally. In a second step, concentrated antigen of required FMD strains may be purchased from internationally accredited vaccine manufacturers and formulate the vaccine locally.

B. Long term: Pakistan should build a modern FMD vaccine production infrastructure as more than 200 million doses of FMD vaccine are annually required in the country. Manufacturing of FMD vaccine locally thus will be cost effective and sustainable for FMD control program in the country.

3. Monitoring of FMD Virus Activity in Punjab

Sero-monitoring is an important tool to gain an insight into disease dynamics. FMD virus infection induces antibodies against non-structural proteins (NSP) and structural proteins (SP) while good quality vaccine only produces antibodies against SP. NSP antibodies against FMD virus NSP survive for 1 to 2 years in cattle and buffaloes. Thus measuring NSP antibodies in animals can indicate exposure of FMD virus in the field. Virus activity was monitored through measuring NSP antibodies by ELISA in various districts of Punjab with different production systems i.e. Dairy Colony Production System in Lahore, Desert Cattle Rearing System in Cholistan and Smallholder Dairy Production System in Attock, Jhang and Rahim Yar Khan. These

analysis showed that 78 % of cattle and buffaloes in dairy colony production system and 61 % cattle in Cholistan had NSP antibodies against FMD NSP. In smallholder dairy production system in villages, the prevalence of NSP antibodies was 37 % in Jhang, 29 % in Attock and 19 % in Rahim Yar Khan



Districts. These studies clearly indicate that FMD virus infection is wide spread throughout Punjab and use of a good quality vaccine should be routinely used for protection against the disease.

4. Cost-sharing Strategy to Enhance FMD Vaccination Coverage in the Country

Use of quality assured Project vaccine is effectively protecting animals against FMD in different production systems as well as animals at risk during outbreaks. As a result of this successful intervention, many dairy farmers particularly in Karachi have approached Project staff to include their animals in the vaccination program. For the



benefit of a large number of farmers and to enhance FMD vaccination coverage in the country, the Project has introduced a cost sharing concept for the enrollment of new farms in vaccination program. Under this program, an Agreement is signed with farmers in dairy colonies, commercial dairy farms, dairy industry or farmers associations in villages for undertaking vaccination on cost sharing basis. Animals are ear tagged for



identification and given primary vaccination. Booster dose is given 3 to 4 weeks later and then vaccination is done after every six months. So far, 598 farms have been registered and 48,314 animals have been covered under the cost-sharing FMD vaccination program. These farmers have reported good protection against FMD using project vaccine.

5. Awareness Seminars for Farmers

The aim of awareness strategy of the project is to make livestock farmers conscious about the



importance of FMD and the benefits to be derived from its prevention. It also emphasizes how farmers can protect their herds from FMD and what actions farmers should take if the disease occurs in their livestock. Six (6) seminars for the awareness of farmers were undertaken during this quarter in different parts of the country and 337



farmers participated in these meetings. In Punjab, three awareness seminars were held; two in Rahim Yar Khan district (33 farmers participated) and one in Bahawalpur district (56 farmers participated). In Khyber Pakhtunkhwa, three seminars were held, one each in Peshawar (82 farmers participated), Shangla (83 farmers participated) and Charsada



(83 farmers participated). Farmers were educated in FMD prevention and control measures. Facilities available in the project for the control of FMD outbreak were also elaborated.

6. FMD Impact Assessment Study

A baseline study for impact assessment of the immunization practices being demonstrated by the project for effective control of FMD was undertaken in collaboration with the Social Sciences Research Institute, NARC, Islamabad. The study was based on a detailed farm level survey with a sample size of 982 dairy farms that included



smallholder rural market oriented (n=779) and peri-urban dairy colonies (n=203). Analysis of the data showed high occurrence (>85% sample farms) of FMD during last five years in peri-urban farms particularly in Karachi and Quetta followed by Peshawar and Islamabad (67%), while lowest in Lahore (21%). The prevalence in rural areas ranged from 14% in AJK to 90% in Balochistan with an overall average of 40 percent. In peri urban dairy

colonies, two main sources i.e purchased animals and neighboring farms were reported for disease transmission, while the rural dairy farmers indicated that mixing with other animals during grazing and common watering source were important factors in spreading the disease. The total value of milk loss due to FMD was calculated at 64590 rupees per cow and 55605 rupees per buffalo in peri-urban dairy production system. In rural smallholder dairy production system, the value of milk loss was calculated at 20871 rupees per cow and 25336 rupees per buffalo. Other monetary losses like mortality in young stock, body weight loss, distress sale, disturbance in calving interval, abortion and permanent lameness were also calculated and indicated as a huge impact on the economy of the country.

7. Mid Term Evaluation Mission

The mid-term evaluation (MTE) of the Project was undertaken by the Office of Evaluation, FAO Hq, Rome through a third party evaluation approach. MTE Mission comprising of Dr. David Hadrill (Team Leader) and Dr. Sajjad Zaheer Malik (Member) visited different project sites in provinces and met various stakeholders from September 20 to October 4, 2014. The Mission visited project sites in Sindh, Punjab and Khyber Pakhtunkhwa and collected information and data, through (i) desk



review of project documents, (ii) visits to institutions and meetings with stakeholders using question checklists and semi-structured interview technique, (iii) direct observation during visits to project-supported farms in different agro-economic zones (peri-urban dairy colonies, rural farms with vaccinated animals, and rural farms with non-vaccinated animals supported during FMD outbreak) (iv) visits to project-supported regional and national diagnostic laboratories, and

(v) meetings with farmers not reached directly by the project. The mission report concluded that: (I) the project has high relevance to beneficiary needs, the West Eurasia PCP-FMD Roadmap and FAO programming priorities. (II) The project's efficiency was rated as very good.



Efficient delivery followed strong management, working closely with Government, the FAO LTU's involvement and technical support and partnership with USDA. The project has been implemented effectively. It has helped Pakistan progress along the PCP-FMD to stage 2. However the financial sustainability of the existing FMD control model was judged as dubious. The Mission also indicated that there may be opportunities to reduce vaccine costs and increase cost-recovery from farmers, but vaccine quality must be maintained. Sustainability will require careful planning and Government commitment. The project was on track and has contributed to the results stated in the Project Document by improving both farmers' livelihoods (through reduced production losses) and food security (by safeguarding milk production). It also contributed to FAO's five Strategic Objectives and to the Organizations seven Core Functions.

The Mid-Term Review Mission recommended that: i) there should be more participation of women in project activities, ii) training needs analysis (TNA)



followed by assessment of learning and tracking of capacity development, iii) government chaired conference to consider future gaps in the FMD control system and to mobilize regional/international resources to address these gaps , iv) project management should work with the GoP to develop an operation system to support the veterinary field officers during FMD outbreak control and response work. This element should be included in the national control strategy plan and in any future phase of the project and v) project management should work on improving the

project logical framework and impact monitoring.



Essentials of An Effective FMD Vaccination

1. Always use good quality vaccine from a reputed manufacturer.
2. Vaccine should have recently circulating FMD virus strains. Currently, 'O' Pan Asia 2, 'A' Turkey 06 and 'Asia- 1' Sindh 08 strains are providing excellent protection against FMD.
3. Strength of each FMD strain in the vaccine should preferably be $6PD_{50}$ rather than $3PD_{50}$.
4. FMD vaccine is temperature sensitive, so cold chain ($2-8^{\circ}C$) during storage and transport should be ensured. The vaccine seller should have functional refrigerator with alternate electric supply (e.g. Generator).
5. Never use frozen FMD vaccine. Freezing destroys vaccine efficacy.
6. Always purchase vaccine from some reliable source. There are some spurious/bogus vaccines available in the market.
7. Never use smuggled vaccine as these vaccines don't contain the relevant FMD virus strains and cold chain is not observed during transportation.
8. Always ensure booster dose after 3 to 4 weeks of primary vaccination in animals which are vaccinated for the first time (calves and newly purchased animals with unknown vaccination status).
9. FMD vaccination should be repeated after every six month.
10. Calves can be vaccinated at 3 months of age.
11. Properly restrain the animal before vaccination.
12. Use $\frac{1}{2}$ inch needle for proper subcutaneous injection.
13. Always dispense exact quantity of vaccine as directed by the manufacturer.
14. Use a separate needle for each herd at least.

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